

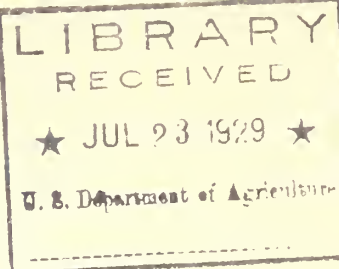
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UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Plant Industry
Washington

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Blister-Rust Control

(C O P Y)



Room 403,
408 Atlantic Ave.,
Boston, Mass.

January 22, 1929.

Mr. R. G. Pierce,
Office of Blister Rust Control,
Bureau of Plant Industry,
Washington, D. C.

Dear Pierce:

I am enclosing herewith a lesson plan for rural schools. My thoughts in this matter are as follows:

The lesson should be simple and short. The chief object of the lesson should be educational value; not to make blister rust experts of the children. I am convinced that the average teacher could do very little in teaching her pupils to identify blister rust infection and the various kinds of wild and cultivated Ribes. Some of the men on our work, who have been with us for years, are not always sure as to the proper identification. I therefore suggest the lesson plan be reduced to a practical exercise consisting merely of the identification of white pine and currants and gooseberries; thinking of the Ribes as a class rather than as species. (Any lesson on the identification of the disease should be given by the blister rust agent or some qualified person.) I also think it desirable to start off your proposed lesson with an introductory paragraph showing the importance of forests to the country, importance of white pine to the forests, and the importance of blister rust to white pine.

I worked up a set of ten questions, which Clave and Pratt have attempted to answer. I have carefully reviewed their answers, and made some changes. On the whole, they are about as submitted by these men. In writing these answers, we have attempted to bring out all the various important points in the life history of the disease.

I hope our efforts will prove of some value.

Sincerely yours,

(Signed) E. C. Filler
Senior Pathologist.

Enclosure

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LESSON PLAN FOR RURAL SCHOOLS

Protection of Our Forests

The forests of this country are one of its greatest natural resources. They produce wood, which we use in some form every day of our lives. They regulate the flow of streams, and conserve the water supply. They also add beauty to the country, and have an immense recreational value. For these reasons, the forests should be used wisely and protected from fire, insects, and diseases.

White pine is one of our most important timber trees, and is also greatly used in reforestation of waste lands. It grows rapidly, produces excellent timber, and the wood is easily worked. Pine forests also have a great scenic value. In recent years, this tree has been threatened by a serious disease, known as the white-pine blister rust. This disease is very deceptive, and an infected tree may appear normal until a short time before its death. Fortunately, blister rust can be controlled. Everyone can help by learning its characteristics and the control methods.

Practical Exercises

Identification: White pine -- currant and gooseberry bushes.

Procedure: Procure some good specimens of the above material. Describe to the children the various characteristics, bringing out the following points:

For white pine -- Number of pine needles in a bundle.
Length of needles.
Stiffness of needles.
Yearly whorls of branches, each whorl denoting a years growth.
Cones: Size -- shape -- texture -- purpose (pine seeds are developed in the cones; under each scale are produced two-winged seeds).

For currant and gooseberry plants:

Size of bush: height.
Manner of growth: upright or spreading.
Arrangement of leaves on stems: alternate or opposite.
Shape and size of leaves.
Odor of leaves when crushed:
(Note cultivated European black currant has tiny yellow resin dots on lower surface of leaves; cultivated red currant does not.
When leaves or stems of black currants are crushed, a strong, pungent odor is apparent, but the odor of red currants is mild and not pungent).
Stems: Smooth or with prickles and bracts.
Fruit: Color -- taste.

After discussing these characteristics, have the children make drawings of various specimens.

It is not thought advisable to instruct the children in the identification of blister rust, due to the difficulty in properly identifying specimens. However, if such practice is desired, it may be possible to arrange a demonstration by the district blister rust control agent. To secure his services, write your State forester.

General Questions

1. What is the white-pine blister rust?

Answer: The white-pine blister rust is a plant disease. It is caused by a fungus plant which, not being able to make its own food, must take its nourishment from other plants. The blister rust fungus lives in the bark of the white pine trees and in the leaves of currant and gooseberry bushes.

2. From where was the white-pine blister rust brought to the United States?

Answer: The white-pine blister rust came to the United States on young white pine trees brought in from Europe before quarantine regulations prohibited such importations.

3. Where is blister rust found in the United States?

Answer: Blister rust is found in all the New England States, New York, New Jersey, Pennsylvania, Michigan, Wisconsin, Minnesota, Idaho, Washington, Oregon, and Montana.

4. What is the appearance of blister rust on currant and gooseberry bushes?

Answer: In the early summer, blister rust appears as orange colored spots on the under side of the leaves of wild and cultivated currant and gooseberry bushes. These spots produce seeds of the fungus that spread the disease to other nearby currant and gooseberry bushes. Later in the summer, these spots are gradually replaced by brown hairlike growths, which produce another kind of seeds of the fungus that spread the disease to white pine trees.

5. What is the appearance of blister rust on a white pine?

Answer: On white pine trees, the fungus produces cankers, which are spindle-shaped swellings of diseased bark with a yellowish discoloration at their edges. During the first three years of their development, these cankers are recognized with difficulty, except by one especially trained in their identification. In the spring of about the third year, white blisters, filled with orange colored spores, or seeds, break through the bark of the cankers. When these blisters break open, millions of spores are scattered by the wind, and spread the disease to the leaves of currant and gooseberry bushes.

6. (A) How far may blister rust spread from infected pine trees to currant and gooseberry bushes?

(B) From infected currant and gooseberry bushes to pine trees?

[illegible]

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Answer: (A) Blister rust may spread for many miles from pine to currant and gooseberry bushes.

Answer: (B) Blister rust ordinarily does not spread more than about 900 feet from currant and gooseberry bushes to pine trees. However, the European, cultivated black currant is an exception, and may spread the disease to pines more than a mile distant.

7. How does the blister rust kill white pine trees?

Answer: The blister rust fungus enters the tree through the needles, then grows slowly down through the bark of the branches and into the bark of the trunk. It kills the bark as it goes along. Thus, when the disease has completely circled the trunk, the tree dies from girdling. Small trees are killed much more quickly than the larger ones.

8. What is the value of the white pine forests of the United States?

Answer: The merchantable white pine forests of the United States are worth over a half billion dollars. In addition, there are many hundreds of thousands of acres of young pine trees, which will make future merchantable forests if protected from fire, insects, and diseases.

9. How can the blister rust be controlled?

Answer: Blister rust can be controlled by uprooting and destroying all wild and cultivated currant and gooseberry bushes within 900 feet of white pine trees. The only exception to this statement is the cultivated European black currant, which should not be grown in pine regions as it spreads the disease for long distances.

10. What has been done to protect the white pine forests from blister rust?

Answer: The Federal and State Government are cooperating with pine owners and towns to control the blister rust disease. To protect the white pines in the Eastern States, over seven million acres of land have been cleared of over seventy million wild and cultivated currant and gooseberry bushes. Many thousands of pine owners and hundreds of towns have cooperated in this work.

